AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1-62. (canceled)

63. (withdrawn) An in-line continuous substrate flow production apparatus for fabrication of copper indium gallium diselenide (CIGS) solar cells, comprising:

a CIGS process chamber in which substrates provided with a molybdenum back contact layer continuously move through a deposition zone (DZ) in the CIGS process chamber, the process chamber comprising a plurality of separated heating elements,

wherein at least one sensor is arranged in the deposition zone and connected to a controller, the sensor being adapted to measure a physical parameter related to a transformation of the deposited CIGS film from a Cu-excessive composition to a Cu-deficient composition, said transformation taking place at a reference transition point in the process chamber as the substrate moves through the process chamber, the sensor being arranged to detect a shift of the actual transition point on the moving substrate from the reference transition point by measuring the physical parameter at the

deposited CIGS film at the reference transition point, the controller being adapted to receive as input a sensor output signal and to deliver as output a corrective signal that adjusts the evaporant fluxes so that the actual transition point is brought back to the reference transition point.

64. (withdrawn) The in-line production apparatus in accordance with claim 63, wherein two sensors, together forming a sensor pair, are arranged at each side of the transition point, that each sensor in the pair is connected to a respective input of the controller, said sensor pair being arranged in a row with the evaporation sources.

65. (withdrawn) The in-line production apparatus in accordance with claim 63, wherein a device for detecting the deposited amount of constituents of the CIGS film is provided in the CIGS process chamber.

66. (withdrawn) The in-line production apparatus in accordance with claim 63, wherein a sensor pair is associated with an individual set of evaporation sources, and the two sensor pairs are arranged at different locations as seen in a direction over the width of the process chamber, that each sensor pair and its associated set of evaporation sources are arranged in a respective row, and that each sensor

pair and set of evaporation sources of a row is connected to a respective controller so as to adjust the evaporation flows in each evaporation set.

67. (withdrawn) The in-line production apparatus in accordance with claim 66, wherein there are two rows each one comprising a set of evaporation sources, the two rows of evaporation sources are arranged at each side of and outside the path along which substrates flow through the deposition chamber.

68. (withdrawn) The in-line production apparatus in accordance with claim 66, wherein a device for detecting the deposited amount of constituents of the CIGS film is provided in the CIGS process chamber.

69. (withdrawn) The in-line production apparatus in accordance with claim 65, wherein the device for detecting the deposited amount of constituents of the CIGS film is an XRF (X-ray fluorescence) device, an EDX (energy dispersion X-ray spectroscopy) device or a profilometer.

70. (withdrawn) The in-line production apparatus in accordance with claim 66, wherein the additional sensor

pairs and associated evaporation sources are arranged in a row at a location between said two rows.

71. (withdrawn) The in-line production apparatus in accordance with claim 70, wherein one or more additional sensors are connected to an input of the respective controllers, the additional sensors being arranged to measure the physical parameter upstream and/or downstream the reference transition point.

72. (withdrawn) The in-line production apparatus in accordance with claim 63, wherein the controller is adapted to change the relative amount of Cu versus In+Ga.

73. (withdrawn) The in-line production apparatus in accordance with claim 63, wherein an x-ray fluorescence composition measurement device is provided in the CIGS process chamber said x-ray fluorescence composition measurement device adapted to measure the total deposited amounts of each element (CU, Ga, In, Se) and thereby the thickness and composition of the deposited CIGS layer.

74. (withdrawn) The in-line production apparatus in accordance with claim 73, wherein the controller is connected to the x-ray fluorescence composition measurement

device and is adapted to adjust the total amount of deposited Cu and/or the total amount of deposited Ga+In in order to keep the thickness of the deposited CIGS layer constant.

75-79. (canceled)

80. (currently amended) An in-line continuous substrate flow production apparatus for fabrication of copper indium gallium diselenide (CIGS) solar cells, comprising:

a CIGS process chamber comprising a deposition zone (DZ) therein, ~~in which~~ the deposition zone configured for substrates provided with a molybdenum back contact layer to be continuously moved therethrough ~~move through a deposition zone (DZ) in the CIGS process chamber~~,

~~wherein~~ the process chamber ~~comprises~~ further comprising:

a plurality of separated substrate heaters,

evaporation sources with Cu, In, Ga and Se, the evaporation sources configured to produce evaporant fluxes for depositing respective amounts of Cu, In, Ga and Se to a substrate, the evaporation sources provided in respective rows over a width of the substrate, ~~and~~

source heaters provided with said evaporation sources, ~~the sets of evaporation sources provided in rows over the width of a substrate, and~~

at least one composition detection device for detecting, in a deposited CIGS film at each of the rows, ~~the~~ respective amounts of elements deposited by said evaporation sources ~~elements in the CIGS at each of the rows~~, and

a controller connected to said at least one composition detection device, the controller adapted to adjust the evaporant fluxes in each of the respective rows in response to a detected variation, in the CIGS film, of the respective amounts deposited ~~amount~~ of ~~the~~ each ~~corresponding~~ element in order to provide a CIGS layer ~~of~~ having a uniform composition of elements.

81. (currently amended) The in-line continuous substrate flow production apparatus in accordance with claim 80, wherein ~~said at least one composition detection device (20) being adapted to measure the deposited amount of constituents of the deposited CIGS film at each of the rows, and~~ said controller being adapted to adjust the evaporant fluxes in the respective rows in order to provide a CIGS film of uniform thickness.

82. (currently amended) The in-line continuous substrate flow production apparatus in accordance with claim 80, wherein ~~there are~~ two rows of vapour sources are arranged over ~~the~~ a width of the process chamber as seen in ~~the~~ a

transport direction of the substrates, ~~wherein~~ the two rows of evaporation sources ~~are~~ being arranged at each side of and outside ~~the~~ a path along which the substrates flow through the deposition chamber.

83. (previously presented) The in-line continuous substrate flow production apparatus in accordance with claim 80, wherein said at least one composition detection device is provided within the process chamber.

84. (previously presented) The in-line continuous substrate flow production apparatus in accordance with claim 80, wherein said at least one composition detection device is provided outside the process chamber.

85. (previously presented) The in-line continuous substrate flow production apparatus in accordance with claim 80, wherein the evaporant vapor sources are arranged at a level below the substrates.

86. (canceled)

87. (currently amended) The in-line continuous substrate flow production apparatus in accordance with claim 80, wherein said at least one composition detection device is

one of an X-ray fluorescence device ~~and/or~~ or an EDX (energy dispersion X-ray spectroscopy) device adapted to measure ~~the~~ total deposited amounts of each element and ~~thereby also~~ to measure the thickness of the CIGS layer.

88. (currently amended) The in-line continuous substrate flow production apparatus in accordance with claim 80, wherein the controller is adapted to receive ~~as~~ an input ~~signal a~~ signal representative of ~~the~~ total deposited amounts of each element and, in response to said ~~latter~~ input signal, adjust the evaporant fluxes from the evaporant sources in order to provide a uniform thickness of the CIGS film.

89. (previously presented) The in-line continuous substrate flow production apparatus in accordance with claim 80, wherein said at least one composition detection device is a device that measures the composition of the CIGS layer indirectly by calibrating against a physical parameter to obtain a measure of an amount of Cu, Ga, and In.

90. (previously presented) The in-line continuous substrate flow production apparatus in accordance with claim 80, wherein said at least one composition detection device is a resistance measuring device.

91. (currently amended) The in-line continuous substrate flow production apparatus in accordance with claim 80, ~~wherein~~ further comprising:

a separate thickness measuring device connected to the controller for measuring the thickness of the deposited CIGS ~~layer~~ film ~~is provided~~, ~~and~~ the controller ~~is~~ being adapted to, in response to a detected thickness variation, adjust the evaporant fluxes from the evaporant sources ~~to in response to a detected thickness variation~~ in order to provide ~~a CIGS layer of uniform thickness~~ a uniform thickness of the CIGS film.

92. (currently amended) The in-line continuous substrate flow production apparatus in accordance with claim 91, wherein the thickness measuring device is a profilometer.

93. (currently amended) The in-line continuous substrate flow production apparatus in accordance with claim 80, wherein ~~there are~~ the evaporant sources with Cu, Ga and In ~~and the evaporant sources~~ are arranged in ~~the following~~ an ~~order as seen in the transport direction~~ of ~~a substrate:~~ Ga, followed by Cu, followed by In, with respect to a transport direction of the substrates.

94. (currently amended) The in-line continuous substrate flow production apparatus in accordance with claim 93, wherein a further evaporation source with Ga is arranged downstream the In evaporation source with respect to the transport direction of the substrates.

95. (withdrawn) The in-line continuous substrate flow production apparatus in accordance with claim 80, wherein there are evaporant sources with Cu, Ga and In and the evaporation sources are arranged in the following order as seen in the transport direction of a substrate: In, Cu, Ga.

96. (withdrawn) The in-line continuous substrate flow production apparatus in accordance with claim 95, wherein a further evaporation source with In arranged downstream the Ga evaporation source.